

FTTx CABLE SPECIFICATION

- Type : Indoor or Outdoor
1F, 2F, 4F, 6F , G.657A2
- Spec. No. : ZX265-1 REV.0
- Customer : Alternetivo
- Date : October 10, 2013

Approved by Jun-Hoo Lee

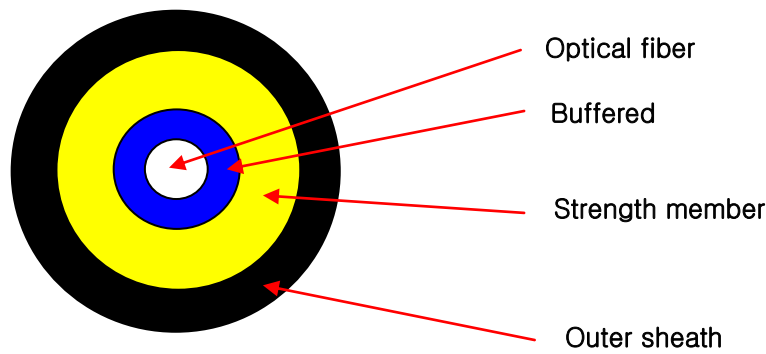
Assistant Manager

Fiber Optic Eng. Team.

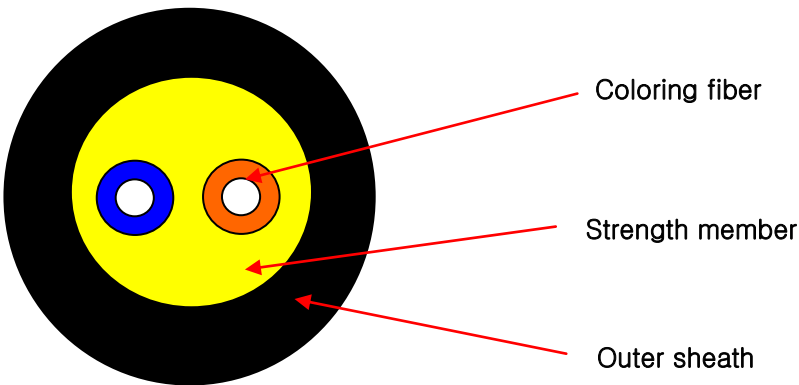
1. Cable Structure

1.1 Cross Section of Fiber Optic Cable

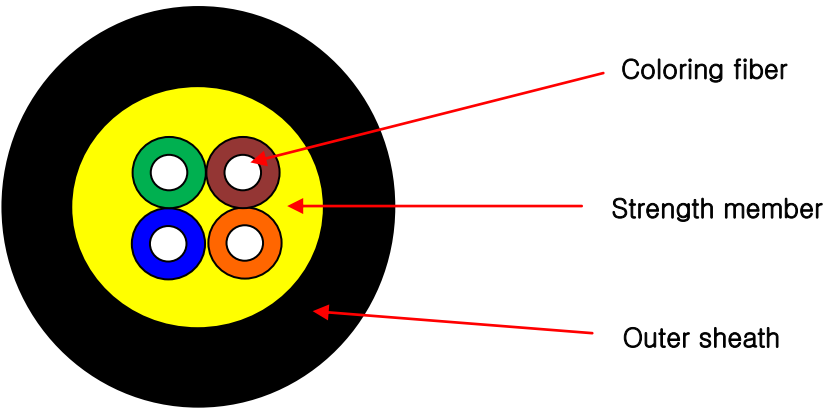
1.1.1 1F



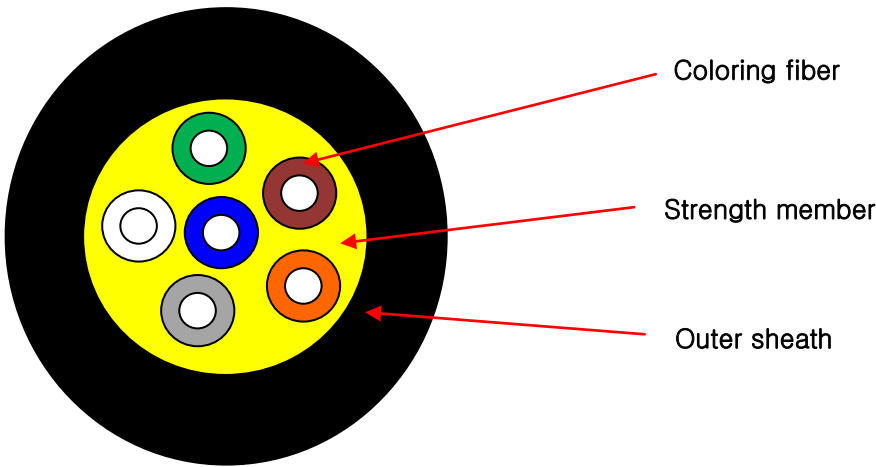
1.1.2 2F



1.1.3 4F



1.1.3 6F



1.2 Construction of Fiber Optic Cable

Structure		Material	SPECCIFICATIONS			
			1F	2F	4F	6F
Optical fiber			SM 9/125um(G657) Natural fiber	SM 9/125um(G657) Coloring fiber		
Buffer or Fiber		LSZH	900 μm ± 50 μm	-	-	-
		color	Blue	Blue, Orange	Blue, Orange, Green, Brown	Blue, Orange, Green, Brown, Gray, White
Outer sheath	Strength member	Aramid yarn	9,000denier	9,000denier	9,000denier	9,000denier
	Sheath	FR-PU	Diameter : 3.0 ± 0.1mm Jacket thickness : 0.75 ± 0.1mm	Diameter : 3.0 ± 0.1mm Jacket thickness : 0.75 ± 0.1mm	Diameter : 3.0 ± 0.1mm Jacket thickness : 0.75 ± 0.1mm	Diameter : 3.2 ± 0.1mm Jacket thickness : 0.75 ± 0.1mm
		color	Black			
Marking			Ink-jet, White , 1m			

1.3 Cable diameter & structure

Fiber Count	Number of Unit	Outer Diameter	Weight (Nominal)	Max. Pulling Strength	Remark
		mm	Kg/km	N	
1F	1U	3.0 ± 0.1	8.4	800	
2F	2F * 1U	3.0 ± 0.1	7.8	800	
4F	4F * 1U	3.0 ± 0.1	7.9	800	
6F	6F * 1U	3.2 ± 0.1	8.6	800	

- Should report the result of the attenuation test with whole length for 1 fiber cable
- Should test the section from the attenuation between starting point(300m) and finishing point(1,000m) for 2 fiber, 4fiber, and 6 fiber cable, and meet the standard of specification.
- Should pass the test for whole length 1drum(1,000m winded with Outdiameter-400mm Drum) sampling from every 25drums of 2fiber, 4fiber, and 6fiber cable

1.4 Marking

1F : Fiber Optic Cable 2016 (Customer) 1x9/125 ITU-T G.657A2 XXXXm

2F : Fiber Optic Cable 2016 (Customer) 2x9/125 ITU-T G.657A2 XXXXm

4F : Fiber Optic Cable 2016 (Customer) 4x9/125 ITU-T G.657A2 XXXXm

6F: Fiber Optic Cable 2016 (Customer) 6x9/125 ITU-T G.657A2 XXXXm

2. Cable characteristic

2.1 The properties of single mode fiber (ITU.G.657A2)

Parameter	Specification
Attenuation coefficient @ 1310 nm @ 1383 nm @ 1550 nm @ 1625 nm	$\leq 0.36\text{dB/km}$ $\leq 0.35\text{dB/km}$ $\leq 0.27\text{dB/km}$ $\leq 0.30\text{dB/km}$
PMD	$\leq 0.1 \text{ dB}(\text{ps}/\text{km}^{1/2})$
Cable cut-off wavelength	$\leq 1260 \text{ nm}$
Zero-dispersion wavelength	1300 ~ 1324 nm
Zero-dispersion slope	$\leq 0.090 \text{ ps}/(\text{nm}^2\cdot\text{km})$
Chromatic dispersion @ 1285 ~ 1330 nm @ 1550 nm	$\leq 3.0 \text{ ps}/(\text{nm}^2\cdot\text{km})$ $\leq 18.0 \text{ ps}/(\text{nm}^2\cdot\text{km})$
Mode field diameter @ 1310 nm	$8.6 \pm 0.4 \mu\text{m}$
Core/Clad concentricity error	$\leq 0.3 \mu\text{m}$
Cladding diameter	$125.0 \pm 1.0 \mu\text{m}$
Cladding non-circularity	$\leq 0.5 \%$
Primary Coating diameter	$245 \pm 5 \mu\text{m}$
Refractive index	1.4690 @ 1310 nm 1.4695 @ 1550 nm
Proof test level	100 kpsi, 1%
20 mm diameter, 1 turn 30 mm diameter, 10	1550nm $\leq \Delta 0.75 \text{ dB/km}$ 1625nm $\leq \Delta 1.5 \text{ dB/km}$ 1550nm $\leq \Delta 0.25 \text{ dB/km}$ 1625nm $\leq \Delta 1.0 \text{ dB/km}$

3. Cable Properties

3.1 Mechanical & Environmental properties

- 3.1.1 Cable bending radius: 10 x cable diameter (during operation)
15 x cable diameter (during installation)
- 3.1.2 Operating temperature range : -20°C to +70°C
Installation temperature range : -10°C to +60°C

3.2 Mechanical & Environmental requirements

No	Item	Test Method	Specification
1	Tensile load IEC60794-1-E1	- Load: 1.3 Reference - Mandrel dia.: $\geq 360\text{mm}$ - Length: 100m - Time: 10 min.	-Loss change $\leq 0.1 \text{ dB @1550 nm}$
2	Crush test IEC60794-1-E3	- Load: 500 N - Length: 100 mm - Time: 5 min.	-Loss change $\leq 0.1 \text{ dB @1550 nm}$
3	Impact test IEC60794-1-E4 (Figure 7a)	- Radius of impacted surface: 25 mm - Impact load: 0.5 kg - Falling height: 150mm - times : 10	-Loss change $\leq 0.1 \text{ dB @1550 nm}$
4	Torsion test IEC60794-1-E7	- Length: 2 m - Load: 50 N - Twist angle: $\pm 180^\circ$ - No. of cycle : 5	-Loss change $\leq 0.1 \text{ dB @1550 nm}$
5	Bending test IEC60794-1-E11A	- Mandrel Dia. : 15 X cable diameter - 6turns	-Loss change $\leq 0.1 \text{ dB @1550 nm}$
5	Temperature Cycling IEC 794-1-F1	- Length : 1,000m: - Temperature cycle: 20°C→-20°C→+70°C→-20°C→+70°C→20°C - Number of cycle: 1 - Time per step: 12 hours	-Loss change $\leq 0.1 \text{ dB/km @1550 nm}$

4. Packing

- The Plastic Bobbin
- Pallet is applied for export

Plastic Drum					Box			Pallet			
Items	Size(mm)				Weight (kg/ea)	material	Size (mm)	Weight (kg/ea)	material	Size (mm)	Weight (kg/ea)
	D1	d2	W	a							
1F/2F 4F/6F	317	147	264	14	1.0	Kraft liner brown	335*345 *370(h)	1.0	Wooden	1010*1050 *120(h)	13.0

Items	Length (km/drum)	Weigt(kg/drum)		Pallet	
		NET	Gross	Packing	Gross weight
1F	1.0km	8.4	10.4	3*3*4=36 box	387kg
2F	1.0km	7.8	9.8	3*3*4=36 box	366kg
4F	1.0km	7.9	9.9	3*3*4=36 box	369kg
6F	1.0km	8.6	10.6	3*3*4=36 box	395kg

